REMARKS/ARGUMENTS

The arguments and amendments submitted herein incorporate the patentability arguments and amendments Applicants discussed with the Examiner during the phone interview on January 24, 2007. Applicants submit that the arguments presented herein make the substance of the phone interview of record to comply with 37 CFR 1.133. During the phone interview on March 16th, the Examiners responded favorably to Applicants patentability arguments, presented herein, and said they would reconsider the rejection in view of these arguments. If the Examiner believes that further information on the interview needs to be made of record to comply with the requirements, Applicants request the Examiner to identify such further information.

1. Claims 1-6, 8-17, and 19-31 are Patentable Over the Cited Art

The Examiner rejected claims 1-6, 8-17, and 19-31 as obvious (35 U.S.C. §103) by Downer (U.S. Patent No. 6,223,244) in view of Dekoning (U.S. Patent No. 6,009,275). Applicants traverse.

Claim 1 recites signaling, as part of a diagnostic operation with respect to an Input/Output (I/O) controller, a reconnection inhibitor over a bus to cause the reconnection inhibitor to access the bus to inhibit the I/O controller from accessing the bus; transmitting as part of the diagnostic operation, by an initiator, I/O requests on the bus to the I/O controller, wherein the I/O requests are queued in an I/O queue, wherein the I/O controller is inhibited by the reconnection inhibitor from draining the queue while the initiator transmits requests to the I/O controller; and performing diagnostic testing of the I/O controller when the I/O queue is at different levels, wherein the level of I/O requests pending in the I/O queue is controlled by the signaling of the reconnection inhibitor.

The Examiner cited col. 1, line 53 to col. 2, line 10 as teaching the claim requirement that the I/O controller is inhibited from draining the queue while the initiator transmits requests to the I/O controller as part of a diagnostic operation. (Final Office Action, pgs. 5-6) Applicants traverse.

The cited cols. 1-2 discuss how the SCSI protocol only allows two devices to communicate at a time over the bus. SCSI devices have a priority, and hosts typically have the highest bus ID. To obtain bus control, devices must wait for the bus to achieve a free phase. The

device with the highest ID value gains access and directs lower priority devices to back off the bus.

The cited cols. 1-2 discuss how devices may gain access to a bus to communicate on the bus using their bus ID which indicates a priority. However, nowhere do the cited cols. 1-2 anywhere teach or suggest the claim requirement that the I/O controller is inhibited from draining the queue by a reconnection inhibitor accessing the bus while a separate initiator transmits requests to the I/O controller as part of a diagnostic operation. Instead, the cited cols. 1-2 discuss how devices arbitrate access to the bus and one device may block another from the bus.

During the phone interview, col. 8, lines 10-37 was discussed, which was cited on pgs. 5-6 of the Office Action. The cited col. 8 mentions that a polling initiator checks lower priority initiators to determine if they have been silent for two consecutive periods or starved. If the polled initiator was starved, then the polling initiator checks to see if the polled initiator returns acknowledgment. If the polled initiator returns acknowledgment, then it is valid and starved, if not, then it is invalid.

Nowhere does the cited col. 8 teach or suggest that as part of a diagnostic operation the polled initiator, which the Examiner corresponds to the I/O controller, is inhibited by a separate reconnection inhibitor from draining its queue while a separate initiator transmits request to the I/O controller to test the queue at different levels. Moreover, nowhere does the cited col. 8 teach that one device send requests to fill the I/O queue while another device accesses the bus to inhibit the I/O controller from accessing the bus and draining its queue.

During the phone interview, the Examiner pointed out that the polling initiator while polling a lower priority initiator could inhibit that polled initiator from accessing the bus to drain its queue. Applicants submit that even if this did occur, this still does not teach or suggest that one device, the claimed initiator, send I/O requests to the I/O controller to fill its queue while another device, the claimed reconnection inhibitor, access the bus to prevent the I/O controller from draining its queue – all as part of a diagnostic operation. Instead, in the cited col. 8 only one device, the polling initiator is checking if the polled initiator is starved and valid. There is no separate device blocking the polled initiator from accessing the bus.

Moreover, nowhere does the cited col. 8 teach that the polling initiator is sending I/O requests to fill an I/O controller queue to test the I/O queue at different levels. Instead, the cited

col. 8 discusses the polled initiator checking the polled initiator to see if it is valid or starved. Sending requests to check if a device is starved or valid does not teach or concern the claim requirements of filling an I/O queue for the purpose of testing the queue at different levels. The cited polling initiator does not send requests to the polled initiators to test their queues at different levels as part of a diagnostic operation, but instead sends requests to see if they are starved and valid.

In the Office Action, the Examiner stated that the claim language does not specify as to which device on the bus the I/O queue belongs. (Final Office Action, pg. 6) Applicants traverse this finding. The claim language defines the I/O queue as part of the I/O controller. For instance, claim 1 states that the requests are transmitted "on the bus to the I/O controller, wherein the I/O requests are queued by an I/O queue", that the I/O controller drains the queue, and that the I/O controller is tested "when the I/O queue is at different levels."

The Examiner cited col. 1, lines 46-47 of Downer as teaching the claim requirement of performing diagnostic testing of the I/O controller when the I/O queue is at different levels. (Final Office Action, pg. 6) Applicants traverse.

The cited col. 1 mentions that initiators communicate with targets through bus requests called commands and thereafter the targets control request resolution. Nowhere does this general discussion of initiator communication teach, suggest or mention the claim requirement of performing diagnostic testing of the I/O controller when the I/O queue is at different levels.

The Examiner cited col. 2, line 66 to col. 3, line 5 and col. 4, lines 41-60 of Downer for the claim requirement that the level of I/O requests pending in the I/O queue is controlled by the signaling of the reconnection inhibitor. (Final Office Action, pg. 6) Applicants traverse.

The cited col. 2 mentions assigning a higher priority device a share of bus bandwidth and that a determination is made as to whether a lower priority device is prevented from accessing the bus for a specified time. If so, the higher priority device is notified to limit the sending of new requests. The cited col. 4 mentions that a ping notifies higher priority initiators that they can send new requests when the starved initiator catches up to its share of bandwidth. If an initiator detects requests not completed, that initiator pings the other initiators with notice of target starvation. Each initiator responds by limiting its bus requests to make bandwidth available to targets. Further, a higher priority initiator polls a lower priority initiator if the

higher priority initiator fails to receive pings from the lower priority initiator for an extended time.

The cited cols. 2, 3, and 4 discuss how initiators check whether a target device is being starved and the actions to take to allow the starved targets access to the bus. Nowhere is there any teaching or suggestion that the level of I/O requests in a queue is controlled by signaling a reconnection inhibitor to access a bus to prevent the I/O controller from accessing the bus for the purpose of testing an I/O queue. Instead, the cited cols. 2, 3, and 4 discuss how a higher priority initiator can provide bandwidth to a starved lower priority target. This does not teach or concern the claim requirements of controlling the level of I/O requests pending in an I/O queue for the purpose of testing the I/O controller when the queue is at different levels.

The Examiner cited Dekoning as teaching that a controller has an I/O queue. (Final Office Action, pg. 7) The Examiner did not cite Dekoning with respect to any of the above discussed claim limitations which the cited Downer fails to teach or suggest. Thus, the cited Dekoning does not overcome the shortcomings of Downer with respect to the claim requirements.

Accordingly, Applicants submit that amended claim 1 is patentable over the cited art because the cited combination of Downer and Dekoning does not teach or suggest all the claim requirements.

Claims 12 and 23 substantially include the requirements of claim 1 in system and device format. The Examiner cited the same sections of Downer and Dekoning with respect to claims 12 and 23 (Office Action, pgs. 13-20) that were cited with respect to claim 1. In claim 23, the "device" element performs the operations of the "reconnection inhibitor" of other claims. Accordingly, Applicants submit that amended claims 12 and 23 are patentable over the cited Downer and Dekoning for the reasons discussed with respect to claim 1.

Claims 2-6, 8-11, 13-17, 19-22, and 24-31 are patentable over the cited art because they depend from one of claims 1, 12, and 23. The following dependent claims provide additional grounds of patentability over the cited art.

Claims 2, 13, and 24 depend from claims 1, 12, and 23 and additionally require that the initiator accesses the bus at a higher priority than the reconnection inhibitor, and wherein the reconnection inhibitor accesses the bus at a higher priority than the I/O controller.

The Examiner cited the above discussed col. 1 of Downer which discusses how devices may be assigned different priorities, some higher than the others, such that higher priority devices may access the SCSI bus over lower priority devices. (Final Office Action, pg. 8)

Although the cited Downer discusses SCSI priority in general, the Examiner has not cited any part of Downer that teaches or suggests assigning a highest priority to an initiator that submits I/O requests to an I/O controller, which is assigned the lowest priority, as part of a diagnostic operation while a reconnection inhibitor (or device for claim 24) that inhibits the I/O controller from draining the I/O queue is assigned a lower priority than the initiator and higher priority than the I/O controller. For instance, the cited Downer discusses how a host may have the highest SCSI priority (ID) and other devices lower priorities. However, the claims require a specific assignment of bus priority to devices performing specific functions in a diagnostic operation with respect to the I/O controller. Nowhere does the cited Downer teach or suggest that an initiator transmitting the I/O requests to the I/O controller for the queue have a higher priority than a reconnection inhibitor blocking the I/O controller from access the bus to drain its queue. The cited Downer's general discussion of priority assignment for SCSI bus access does not teach or suggest the specific claimed assignment of priorities to specific devices involved in a diagnostic operation as claimed.

Accordingly, the additional requirements of claims 2, 13, and 24 provide additional grounds of patentability over the cited art.

Claims 5 and 16 depend from claims 1 and 12 and further require signaling the reconnection inhibitor to cease accessing the bus, wherein the I/O controller accesses the bus to complete processing of an I/O request and process further I/O requests in the I/O queue in response to the reconnection inhibitor ceasing to issue requests on the bus. Claim 27 depends from claim 23 and recites receiving the signal to cease accessing the bus.

The Examiner cited col. 1, lines 61-65 and col. 2, lines 8-12 of Downer as disclosing the additional requirements of these claims. (Final Office Action, pg. 10) Applicants traverse.

As discussed, the cited col. 1 discusses how different devices have different SCSI priorities that are used to control their access to bus, such that devices having a higher priority may access the SCSI bus over devices with a lower priority. The cited col. 2 mentions that the winning device (of higher priority) must proceed through additional phases to complete its task and the losing device (lower priority) must wait for the bus to achieve another bus free phase.

Nowhere do the cited cols. 1 and 2 anywhere teach that a reconnection inhibitor (or the device in claim 27), previously signaled to access a bus to inhibit an I/O controller access as part of a diagnostic operation, is further signaled to cease accessing the bus to allow the I/O controller to access the bus to complete processing queued I/O requests. Instead, the cited Downer discusses priority access of a SCSI bus in general and how a lower priority device must wait until the bus is free from higher priority devices before being able to access the bus. This does not teach or suggest the specific claimed bus access operations as part of a diagnostic operation as claimed.

Accordingly, the additional requirements of claims 5, 16, and 27 provide additional grounds of patentability over the cited art.

Claims 6, 17, and 28 depend from claims 5, 16, and 27 and further require that the I/O queue is increased by signaling the reconnection inhibitor to access the bus to inhibit the I/O controller from accessing the bus and depleting the I/O queue, and wherein the I/O queue is decreased by signaling the reconnection inhibitor to cease accessing the bus to inhibit the I/O controller.

The Examiner cited the col. 2, lines 6-12 and the general elements, such as a host, etc. of Downer as disclosing the additional requirements of these claims. (Final Office Action, pgs. 11) Applicants traverse.

The cited col. 2 mentions that the winning device (of higher priority) must proceed through additional phases to complete its task and the losing device (lower priority) must wait for the bus to achieve another bus free phase.

Although the cited Downer discusses how one device, such as a host, may access the bus over lower priority devices and that lower priority devices must wait for the bus to be free, nowhere does the cited Downer teach or suggest controlling the level of I/O requests in a queue by signaling a reconnection inhibitor (or device for claim 28). The Examiner has not cited any part of Downer that teaches increasing the I/O queue by signaling the reconnection inhibitor to inhibit I/O controller access to the bus and decreasing the I/O queue by signaling the reconnection inhibitor to cease accessing the bus. Instead, the cited col. 2 mentions in general how a higher priority device may block a lower priority device from the queue and the lower priority device must wait for the bus to be free before attempting to gain control of the bus. This does not teach the specific claim requirements of how to increase and decrease an I/O queue

level by signaling a reconnection inhibitor to access or cease access to inhibit or not inhibit the I/O controller from accessing the bus.

Accordingly, the additional requirements of claims 6, 17, and 28 provide additional grounds of patentability over the cited art.

Conclusion

For all the above reasons, Applicant submits that the pending claims 1-6, 8-17, and 19-31 are patentable over the art of record. Applicants have not added any claims. Nonetheless, should any additional fees be required, please charge Deposit Account No. 09-0449.

The attorney of record invites the Examiner to contact him at (310) 553-7977 if the Examiner believes such contact would advance the prosecution of the case.

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